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10. Как астронавты выбирали место посадки на Луне?

12-15 minutes

Now I will tell you how, according to NASA legend, astronauts chose a place among the mountains and craters, where they would land on the moon. Everything that I will write is the official version of NASA.

In the 50s of the twentieth century, 10 years before the flight of Yuri Gagarin, Hollywood directors imagined that the landing of a spaceship on another planet would look like this: two pilots sit in front of a large screen (or window) and choose the best place to land. Well, almost like on an airplane.

Spaceship landing on another planet. Still from the film "When Worlds Collide", USA, 1951

But NASA used a fundamentally different lunar landing system. First, there were no chairs to sit. The astronauts were standing. Secondly, the astronauts approached the moon not facing forward, but with their backs. Not even that. Astronauts approached the Moon feet first and upside down.

To roughly understand what it looks like, get up from the table, and then bend at the waist at a right angle, in the form of the letter "L", as if you want to pick up a fallen hundred dollars from the floor. And now, without unbending, start moving your booty forward and imagine that the floor in front of you is the lunar surface, and after a while you must choose a place for landing.

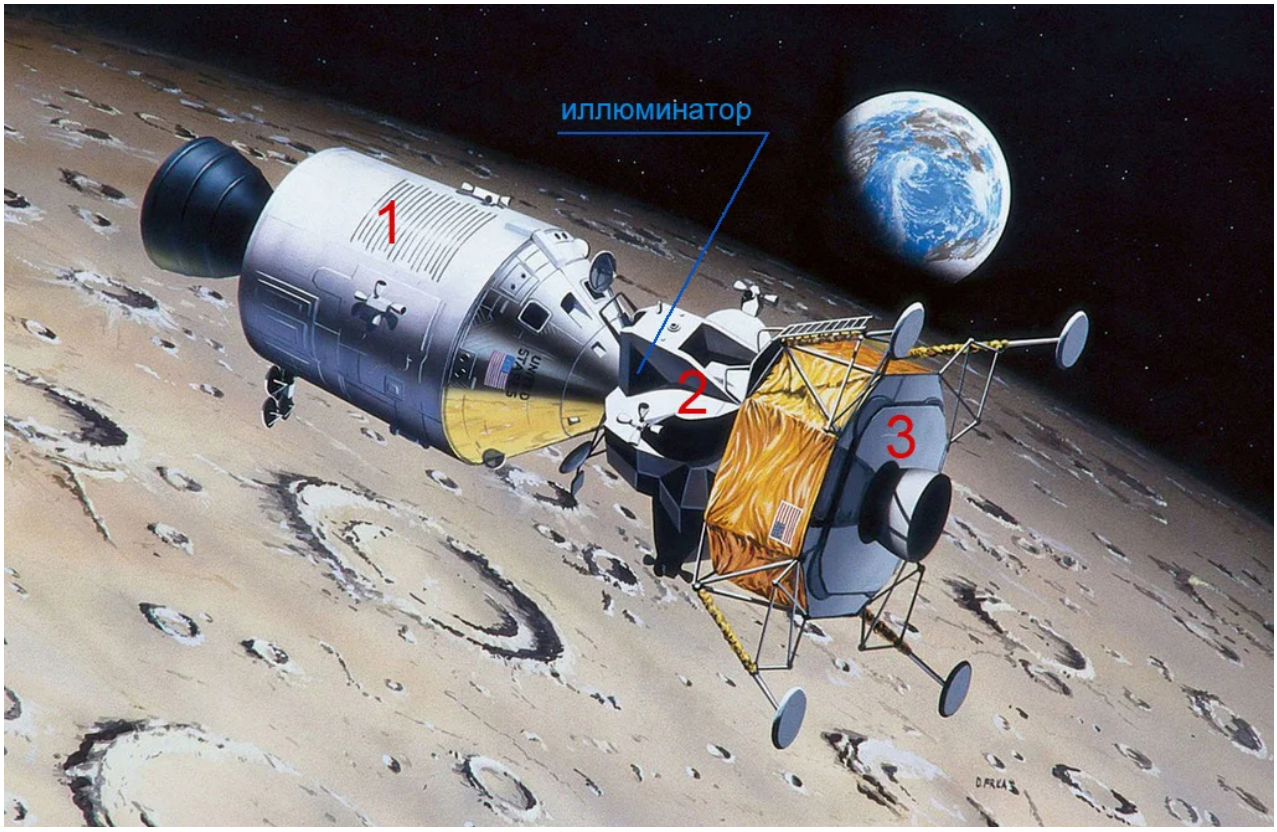
To make it clearer for you how the astronauts were located in the lunar module a few minutes before landing, I will now give a picture.

If you were interested in the lunar theme, then you probably know that in the Apollo mission, three rockets are flying to the moon at once, sequentially attached to each other, and three astronauts.

If you were not interested in the technique of landing on the moon, then in a nutshell I will explain the flight scheme. Moreover, science fiction artists from NASA have drawn many color pictures on this topic.

A launch vehicle with a height of more than 110 meters is launched from the Earth. In the lower part of the launch vehicle there are fuel tanks, detachable stages, and at the very top there are three small rockets connected into one "train". These three small rockets under the general name "Apollo 11" and weighing about 45 tons approach the Moon, enter the lunar orbit and fly parallel to the lunar surface at an altitude of about 100 km at a speed of about 2 km / s.

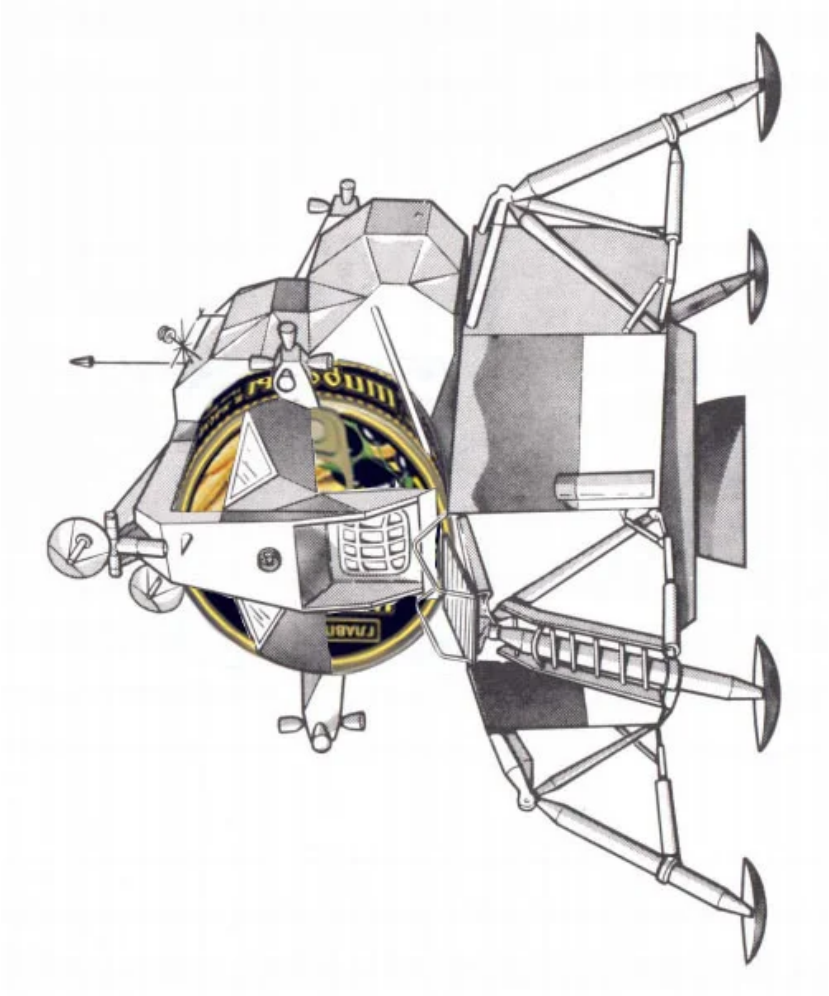
Each small rocket has its own engine, so in the picture you see two nozzles, rocket 1 and rocket 3, pointing in opposite directions. The rocket nozzle 2 is not visible from this angle.



Apollo 11 is a bundle of three rockets: 1 - command compartment, 2 and 3 - lunar module.

In the form of such a "train", Apollo (according to the NASA fairy tale) makes several orbits around the Moon. Then the command compartment "1", in which there is one astronaut, remains in lunar orbit, and the lunar module in the form of a twin ("2 + 3") prepares for landing on the Moon. The weight of this descent lunar module is about 15 tons. Inside it, in the rocket "2", which is called the "take-off stage", there are two astronauts.

The cylindrical compartment with two astronauts is rather narrow and looks like a tin can. He is sometimes portrayed that way.



The astronauts are in a narrow, cylindrical compartment that looks like a tin can.

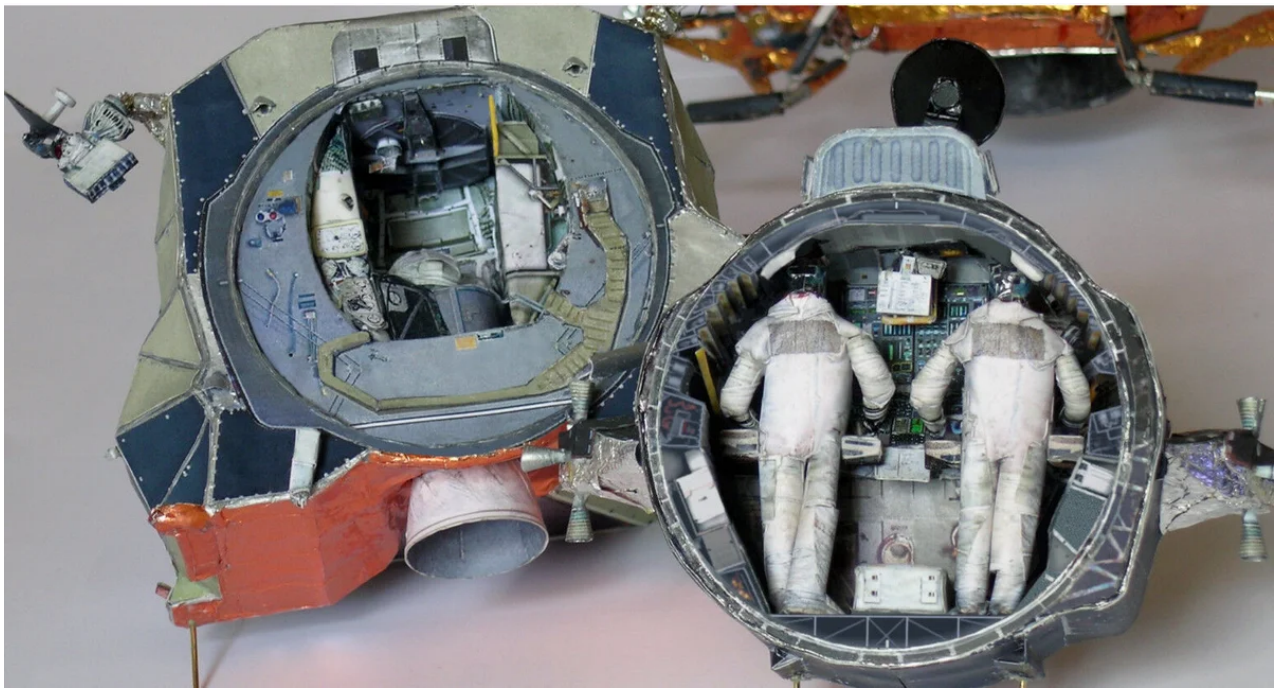
Looking at the supports of the lunar module (4 legs), it is easy to guess in what position there are two astronauts inside. Since there are no chairs inside, they do not stand, but "lie" horizontally and look into the windows directed vertically downward.

In this position, with their feet forward and head downward, the astronauts fly in the lunar module.

The lunar module then detaches from the command bay to initiate deceleration.

The lunar module (on the right) separates from the command bay (on the left). Nice drawing, almost like Stanley Kubrick.

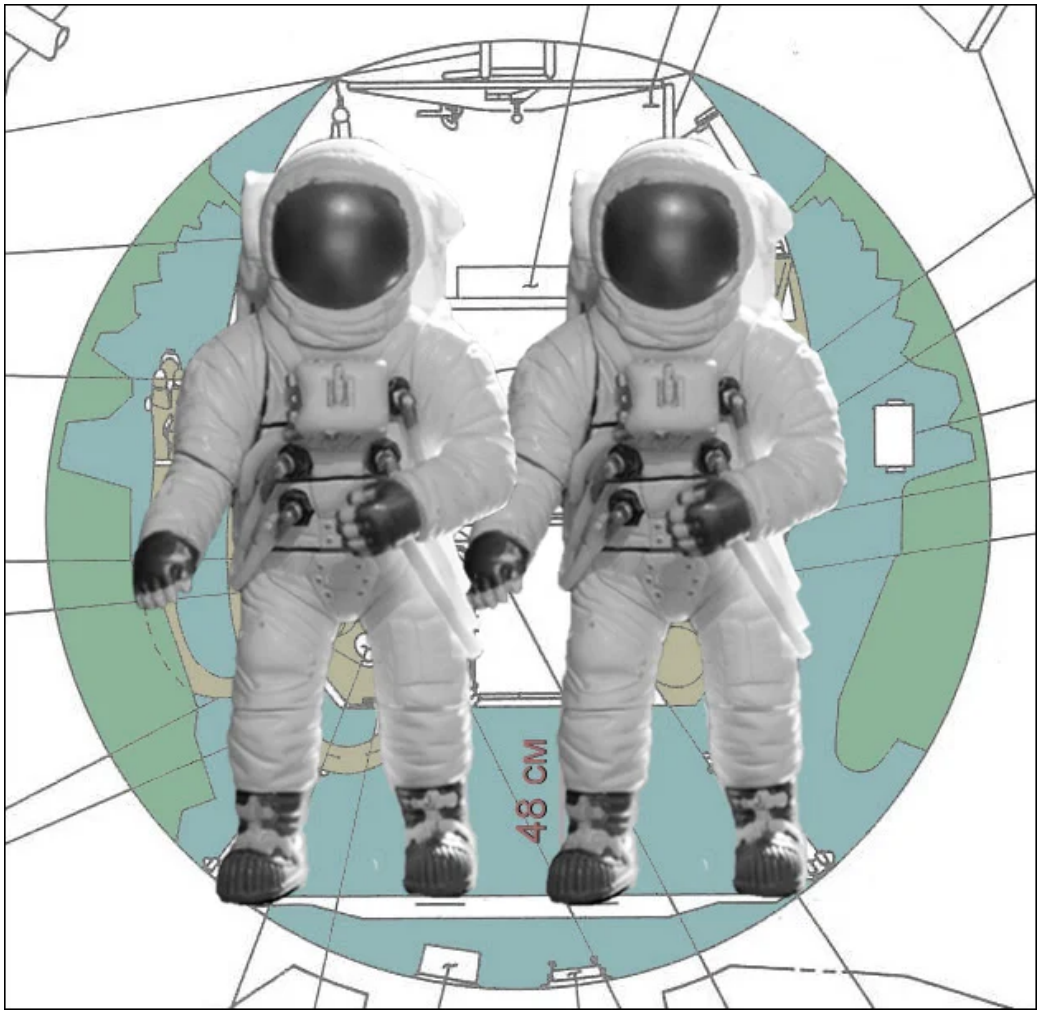
Braking is carried out by motors working against the movement. As soon as the engines are turned on, weightlessness disappears, the overload increases, and the astronauts are pressed to the floor. At the same time, the astronauts lie down on the dashboard with their chest. This is how it looks in section.



Sectional view of the takeoff compartment (rocket "2"). Bell's engine nozzle is visible in the left half.

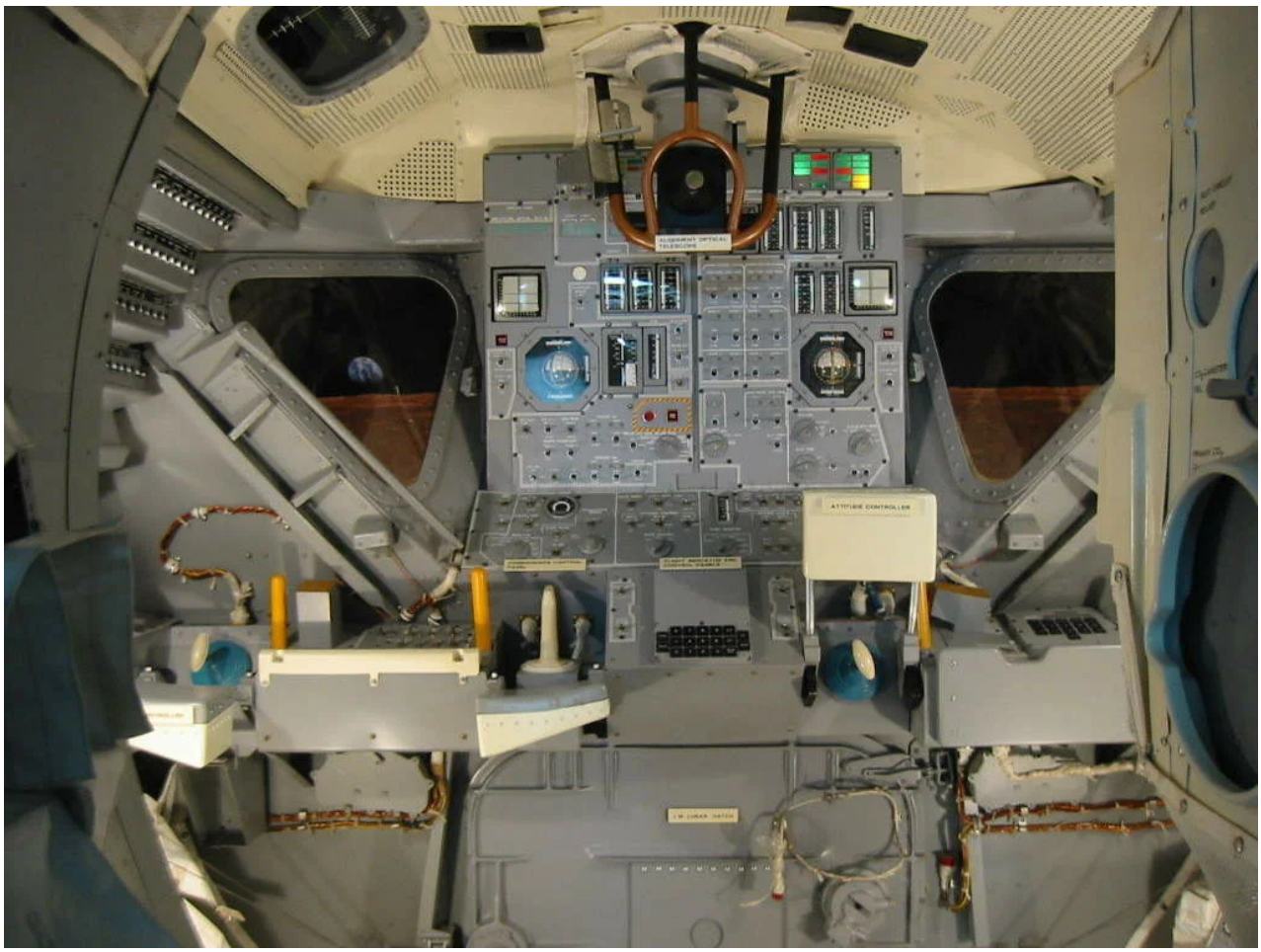
It should be added that on this model (on this model) the astronauts were portrayed as too thin, as if they were not in spacesuits, but in tracksuits.

If drawn at the correct scale, they will look something like this:



Two astronauts in a cylindrical compartment. The figures of the astronauts are copied from the famous photograph of Buzz Aldrin.

Of course, you are wondering what did they breastfeed on? Here you are, an interior view of the lunar module.



View of the lunar module inside. Two portholes (left and right), an exit hatch (below) and a dashboard with joysticks.

Now, I hope you can imagine in what position astronauts fly over the Moon? They are looking through these windows, flying feet first in a horizontal position, lying on the control panel. And the panel protrusions rest against them in the groin.

And the lunar module continues to slow down by braking. You can easily remember your feelings when the car, gaining a speed of 100 kilometers per hour, sharply brakes.

So, the lunar module slows down sharply. Only the initial speed is not 100 km / h, but 6000 km / h (this is 1.7 km / s). As you understand, trying to choose a landing site at a speed of 6 thousand km per hour is pointless, if only because the lunar module will have time to fly another 500 kilometers before it comes to a complete stop.

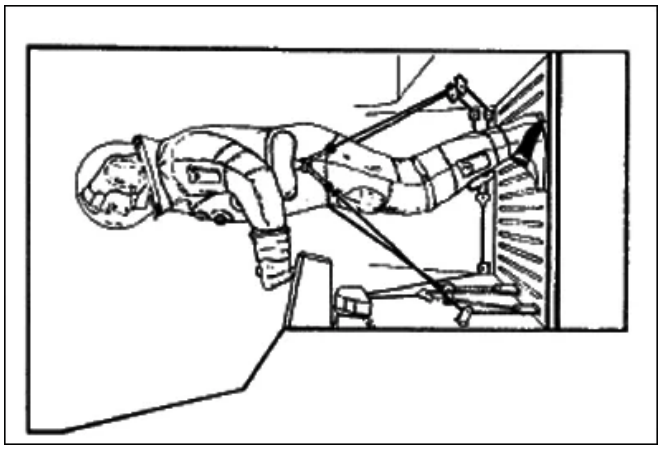
This is how modern crooks describe the beginning of the moon landing (I quote from Wikipedia):

At the end of the 13th orbit, over the far side of the Moon, the engine of the lunar module landing stage was turned on for 29.8 seconds, the Eagle entered the descent orbit with an apoliation of 105.9 km and a perilune of 15.7 km. It flew forward with the landing stage legs and portholes down so that astronauts could track landmarks on the surface. Armstrong noticed that one of the landmarks, Maskelyne W crater, they passed about 3 seconds earlier than expected. This meant that they would land beyond the calculated point.

The descent vehicle sharply decreases its speed. Astronauts are overwhelmed. And, like real Spartans, they can withstand overload while standing on their feet and lying with their chest on the joysticks. Do astronauts' legs give way? Or are astronauts made of real iron?

- Not! - NASA propagandists will exclaim. - The astronaut is secured with lounges inside.

And then they will bring a drawing.

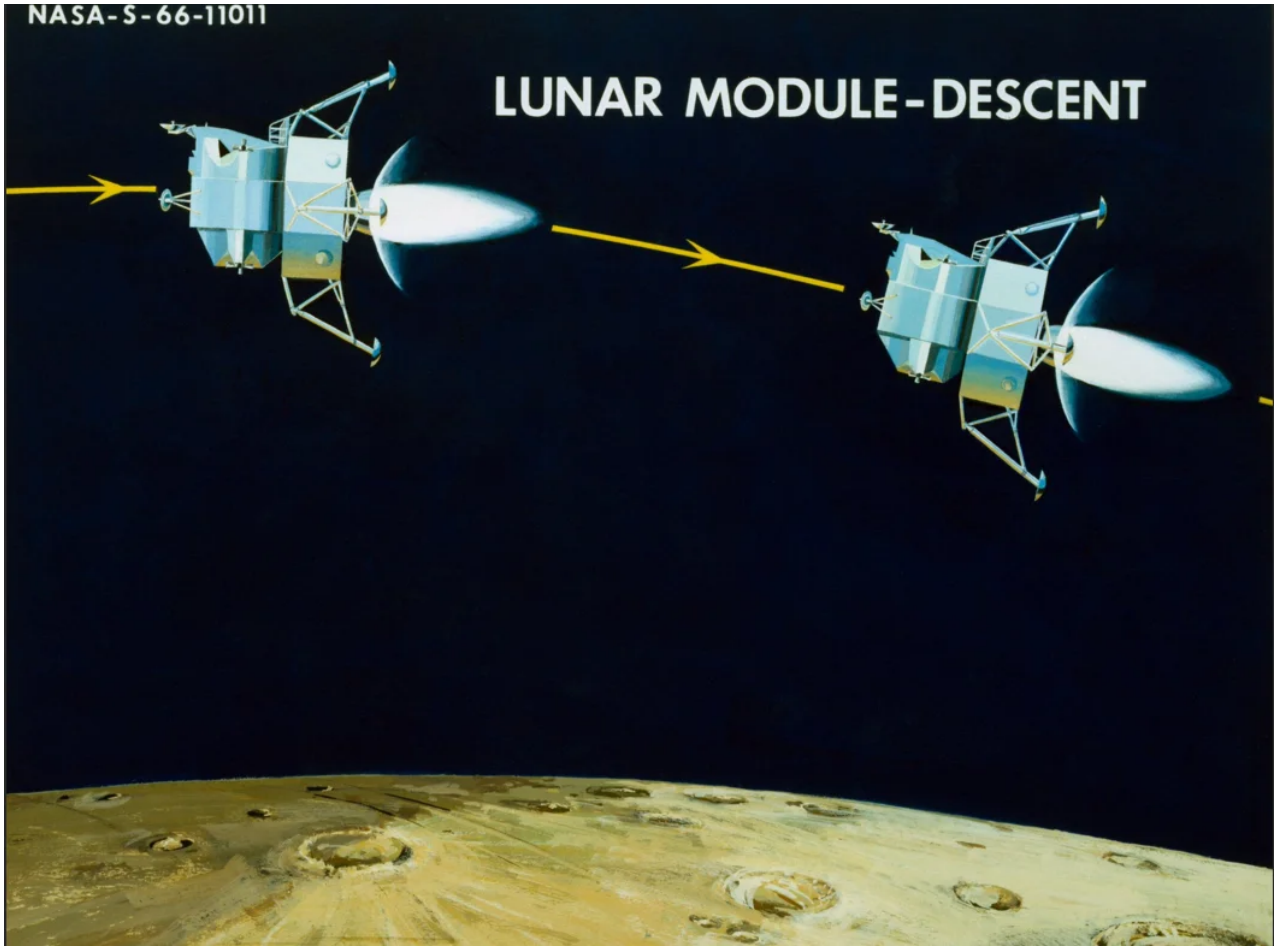


The astronaut is strapped to the floor inside.

Are these lounges needed to keep the astronaut from flying up? But when landing on the moon, he should be pressed to the floor! How can a lodge with wheels help here? Press him even harder to the floor?

And when the lunar module (take-off compartment) takes off from the moon - the same effect. These ropes only get in his way. They pull him down. And the acceleration already pushes him down, to the floor. To the dead - poultices. It was necessary to tie the ropes to the ceiling! It is necessary to convey to the curators from NASA, so that the drawing in the training manuals is urgently corrected. Longy to the ceiling!

Then the lunar module rotates around its axis by 180 **°.** Those. portholes that looked vertically downward now appear vertically upward.



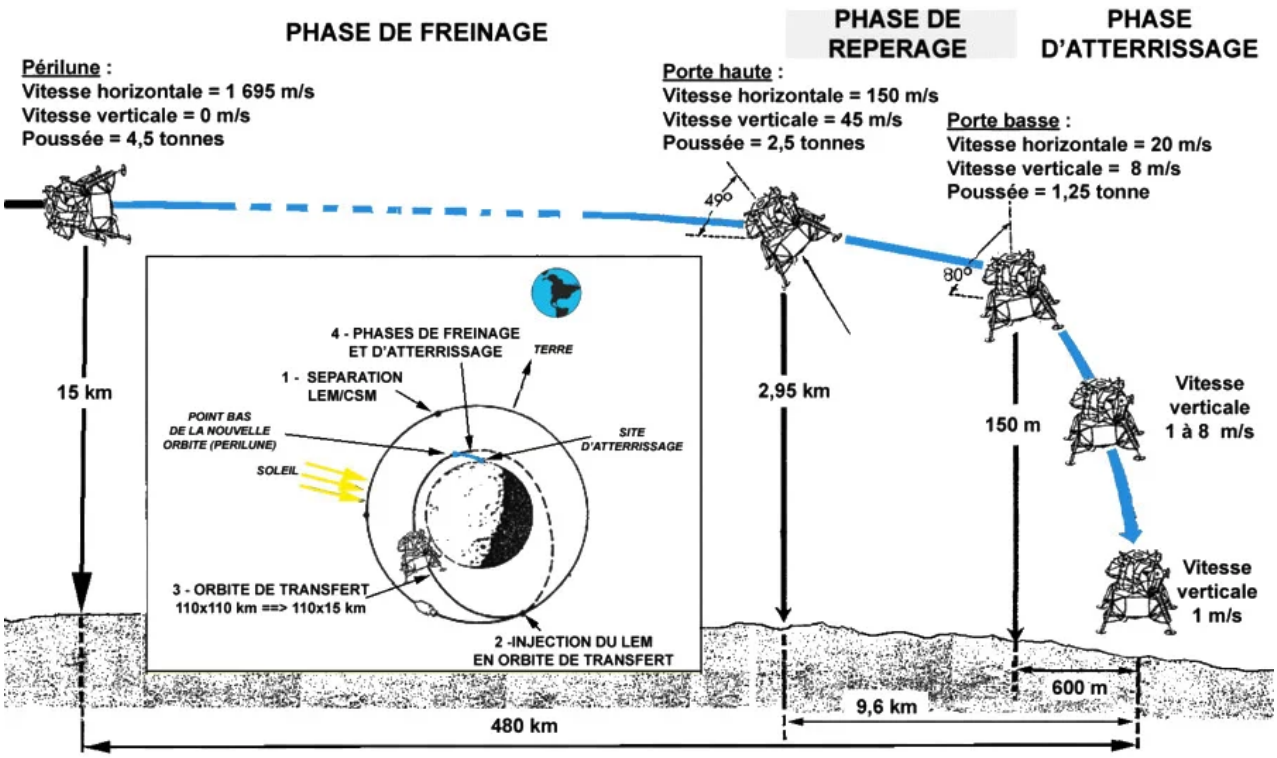
The lunar module turned its windows upward. The little black triangles on the takeoff bay are the windows.

What does the astronaut see through the window now? Of course, the starry sky! And focusing on the stars, and lying with his back on the wall of the lunar module, Armstrong (or another commander) begins to choose a landing site.

I continue to quote the julvernes from NASA:

Approximately 4 minutes later, the Eagle was tilted 180 °, portholes up, Armstrong and Aldrin saw the Earth almost directly in front of them.

The lunar module moves fully to a vertical position only at a height of about 46 meters above the surface. Before that, at an altitude of 15 km, it passes a horizontal section of about 480 km and dampens the speed from 1.7 km / s to 0.15 km / s (0.15 km / s is 540 km / h). The horizontal section of the flight lasts more than 8 minutes. What does the astronaut see?



Lunar module landing scheme.

First, for 4 minutes, the astronaut sees the surface of the Moon rushing under him, and then, for the next 4 minutes, when the speed decreases, only the starry sky.

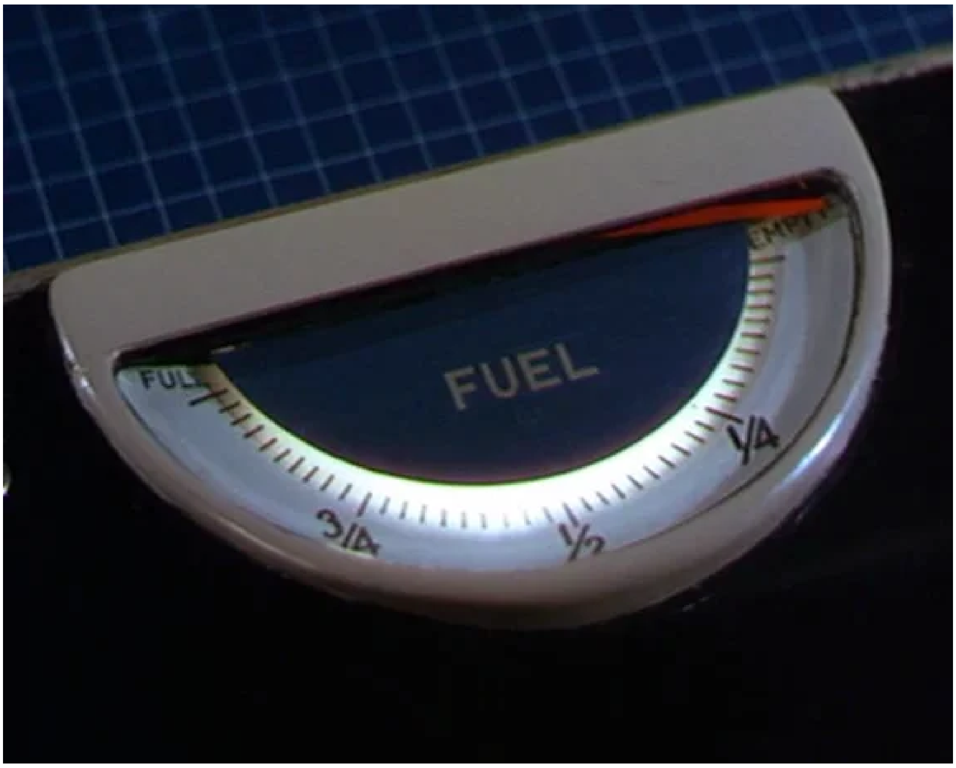
And how do modern julvernes describe the landing on the moon?

At an altitude of about 460 m, Armstrong saw that the autopilot was guiding the ship to a point on the near edge of a large crater surrounded by a field of boulders up to 2-3 meters across (it was later determined to be West Crater, 165 m in diameter). He told the survey that at first he thought it was a good place, since from a scientific point of view, landing next to a large crater would be very valuable. However, Armstrong quickly realized that it would not be possible to land the Eagle in a safe enough place before reaching the crater. fly it over.

... ..Aldrin said that 8% of the fuel remained.

... Aldrin reported that 5% fuel remained and that a warning had come on. The 94-second countdown began, after which Armstrong had only 20 seconds left to land the ship or ....

Then I broke down and cried from the experience! How many times have I seen this moment in Hollywood movies! The spacecraft lands on another planet, a whole kilometer to the landing site, but the gas tank runs out of gasoline. The engines go out one by one. Death is inevitable. The pilot takes over manual control, and thanks to his courage, everyone remains alive.



The starship ran out of gas. A scene from the fantastic film "When Worlds Collide", USA, 1951

According to the flight technology proposed by the United States, the astronauts were waiting for inevitable death. This is a dead end road. It did not provide for an insurance system. After all, even parachutists have a reserve parachute for an unforeseen situation. And for astronauts, Bell's engine on the lunar module did not even pass serious tests. To send astronauts thousands of miles away without testing the engine for vertical landing, without providing for an emergency flight option is simply a shame for the United States. American technology for a flight to the moon differs sharply from the Soviet program. According to the plan, the links of which the USSR began to implement, a spacecraft without a crew first flies to the moon. Only when we are convinced that he has landed safely and all his systems are functioning normally, only then do the lunar rovers go to the moon. The lunar rovers choose a flat landing site and, in addition, they are radio beacons towards which the interplanetary station with people is moving. Therefore, there should be at least two lunar rovers. And the third stage is a person flies. The moon is mountainous. The leg of the lander fell into a hole or hit a large rock - and that's it, the craft will tilt or even fall, no longer take off and will not return to Earth. What if something happened to the engine? For this case, we have an emergency exit. On the lunar rover, the cosmonauts get to a spare spacecraft standing not far away, 2-3 km away, which landed a few days before the arrival of people. The leg of the lander fell into a hole or hit a large rock - and that's it, the craft will tilt or even fall, no longer take off and will not return to Earth. What if something happened to the engine? For this case, we have an emergency exit. On the lunar rover, the cosmonauts get to a spare spacecraft standing not far away, 2-3 km away, which landed a few days before the arrival of people. The leg of the lander fell into a hole or hit a large rock - and that's it, the craft will tilt or even fall, no longer take off and will not return to Earth. What if something happened to the engine? For this case, we have an emergency exit. On the lunar rover, the cosmonauts get to a spare spacecraft standing not far away, 2-3 km away, which landed a few days before the arrival of people.

This is what the technology for going to the moon should look like if we want people to go back. And what the Americans have proposed is just a fairy tale, made according to the templates of Hollywood.

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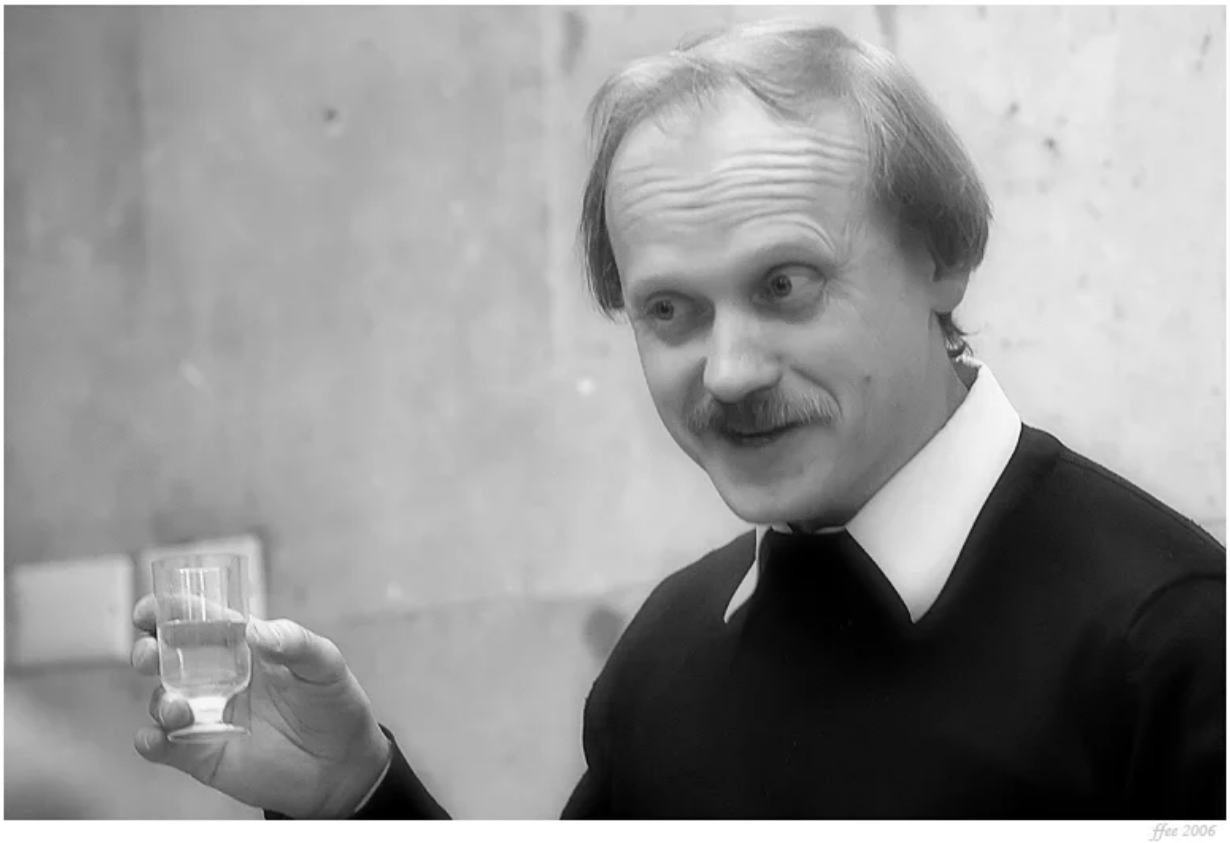
Cameraman L. Konovalov was with you



In hand - film fixer.

Until next time!